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A
Novel Hot - Water Apparatus
FOR
Rain or Douche Baths.

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A Novel Hot-water Apparatus for Rain or Douche Baths.

IN my recent article on "The Modern Rain-bath"¹ I referred, in speaking of the hot-water arrangements for bathing purposes, to a novel and ingenious form of hot-water apparatus. This is called a "Gegenstrom Apparat," and it is now extensively used in Germany. It is invented and patented by Mr. Schaffstaedt, of Giessen, Germany.

The water is heated in this apparatus by means of high or low pressure, or by exhaust steam, and the apparatus derives its name from its special construction, it being so arranged that the cold water and steam travel in opposite directions (*Gegenstrom*) without at all mixing together.

The Figures, 1 and 2, show a section and elevation of a small size of this heater. The cold water enters at *a* and travels upward in the direction of the arrow, while steam enters at *b* and travels downward, issuing in a condensed form at outlet *c*, which may be connected with the return steam-pipes. Pipe *d* carries the warm water to the douche *e*, which is placed inclined at a proper height above the bather. The water and steam cocks are designated by letters *f* and *g*, and a hot-water thermometer is placed at *h*.

The object of the apparatus is to heat water instantaneously to any desired temperature by means of steam, without the latter passing through the water. This it accomplishes thoroughly; the water is uniformly heated and the apparatus works without any noise whatever.

¹ Published in the *American Architect* of February 10, 1894.

It is so simple, and at the same time so efficient in construction, that the writer, with the approval of the medical superintendent of the Utica State Hospital, has adopted and ordered for its new bath-house now in course of construction, four heaters, each capable of supplying warm water for twelve douches, each discharging, on an average, about two and a half or three gallons per minute of warm water heated to 100° Fahrenheit. These will be the first "Gegenstrom" apparatus put in actual use in the United States.

In this apparatus, as is clearly seen in the illustration, the water and steam valves are so arranged that it is impossible to turn on the steam without first turning on the water. Moreover, the amount of heating-surface is so calculated and adjusted in all apparatus constructed specially for bath purposes, that for a certain constant pressure and temperature of steam, the temperature of the warm water will not exceed 110° Fahrenheit, when all the douches for which the apparatus is calculated are running simultaneously.

All similar appliances for warming water by direct admixture of steam are open to the objection that it is impossible, owing to changes in the water and steam pressure, to control exactly the temperature of the warm water. Sometimes the steam is not completely condensed, and, as a result, the bather may be scalded by particles of steam escaping with the water. Moreover, all mixing-valves for steam and water cause more or less disagreeable noises, and often the water becomes impregnated with a peculiar odor, or else it is rendered somewhat impure by admixture of oil from the steam-pipes. The chief advantages claimed for the "Gegenstrom" apparatus are the following :

1. It accomplishes the instant warming of any quantity of water to any desired temperature; that is, by turning on both the cold water and the steam, the water which is admitted cold is discharged as warm water at the douche or at the nozzle; hence this apparatus effects a saving in time.
2. It also saves the first cost of a hot-water reservoir or boiler, because no such reservoir is needed; the space needed for the usual hot-water tank can be appropriated for other uses.
3. It saves fuel, because there is no heat wasted as is the case with hot-water reservoirs.
4. The warm water generated by this method has no bad smell or bad taste, and is not in any way rendered impure.

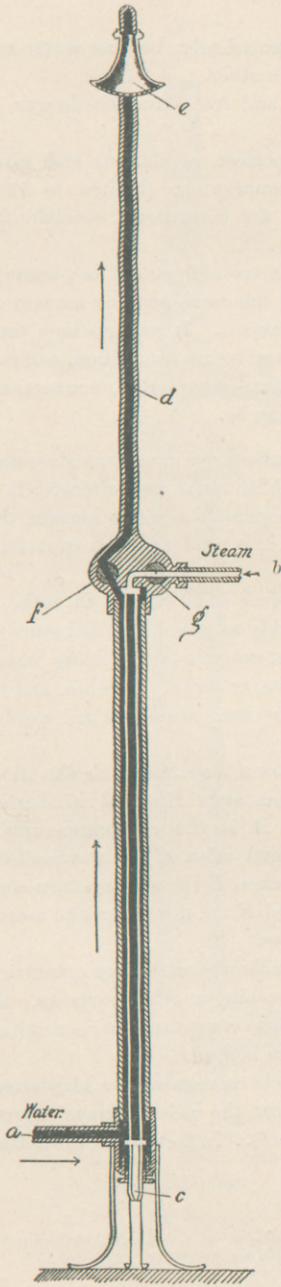


Fig. 1.

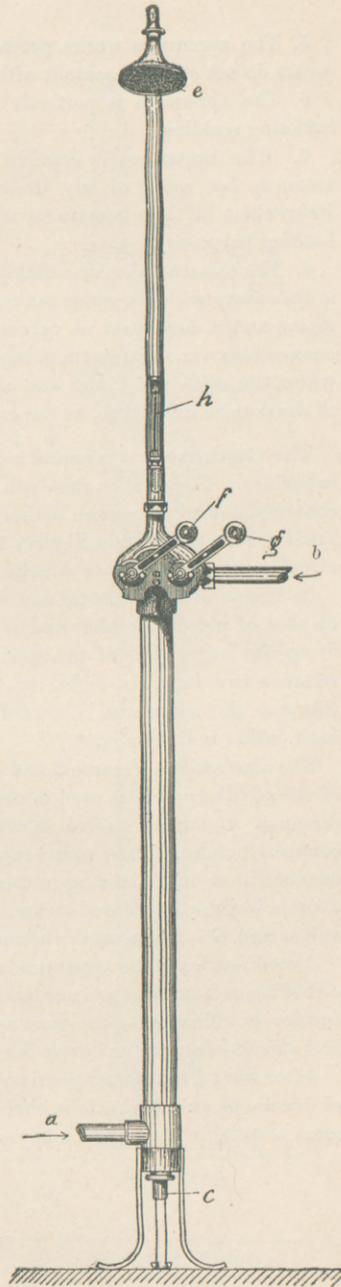


Fig. 2.

The Gegenstrom Apparatus: small size.

5. The apparatus works perfectly noiselessly, because water and steam do not come in contact with each other.

6. The apparatus is perfectly safe and free from the danger of inflicting scaldings.

7. The apparatus is capable of perfect regulation, and gives instantly hot water of any desired temperature (limited to 110° Fahrenheit in those apparatus which are constructed specially for bathing purposes).

8. The apparatus is exceedingly economical in actual use, because it does away with hot-water tanks, and the corresponding amount of piping and a double set of valves or faucets. It requires only four connections, viz.: two steam, a supply and return connection, and two water, the cold-water inlet and the warm-water outlet, connections to the douche or the tub, as the case may be.

The Gegenstrom Apparatus is manufactured in various sizes and capacities. For smaller rain-bath establishments, and wherever it is contemplated to allow each bather to regulate the water himself, the smallest size, as shown in Figures 1 and 2, is used and each apparatus supplies but one nozzle or douche.

In larger establishments, and wherever it is desired to bathe a number of people together and as quickly as possible, it is better to fit up the larger sizes of the apparatus, capable of supplying warm water to two, four, six, eight, ten, twelve, or twenty douches, and in this case the apparatus is controlled by some attendant and not by each bather individually.

The illustrations, Figures 3 and 4, show a front and a side elevation of one of the apparatus used in the Utica State Hospital rain-baths, designed to supply twelve douches. *A* is the cold-water-supply connection inlet, *B* the steam-supply and inlet, *C* the warm-water connection or outlet leading to the douches, *D* the steam return connection for the condensed steam, *E* and *F* are the water and steam valves and *G* is a hot-water thermometer.

A modification of the apparatus is suitable wherever large quantities of boiling or hot water are needed for washing or other purposes. A further modification of the same apparatus constitutes an economical and efficient feed-water heater for steam boilers.

After what I said in my previous article concerning the adaptation of douche or rain-baths, it is obvious that the "Gegenstrom" apparatus is suitable for a great many purposes. In fact, wherever steam

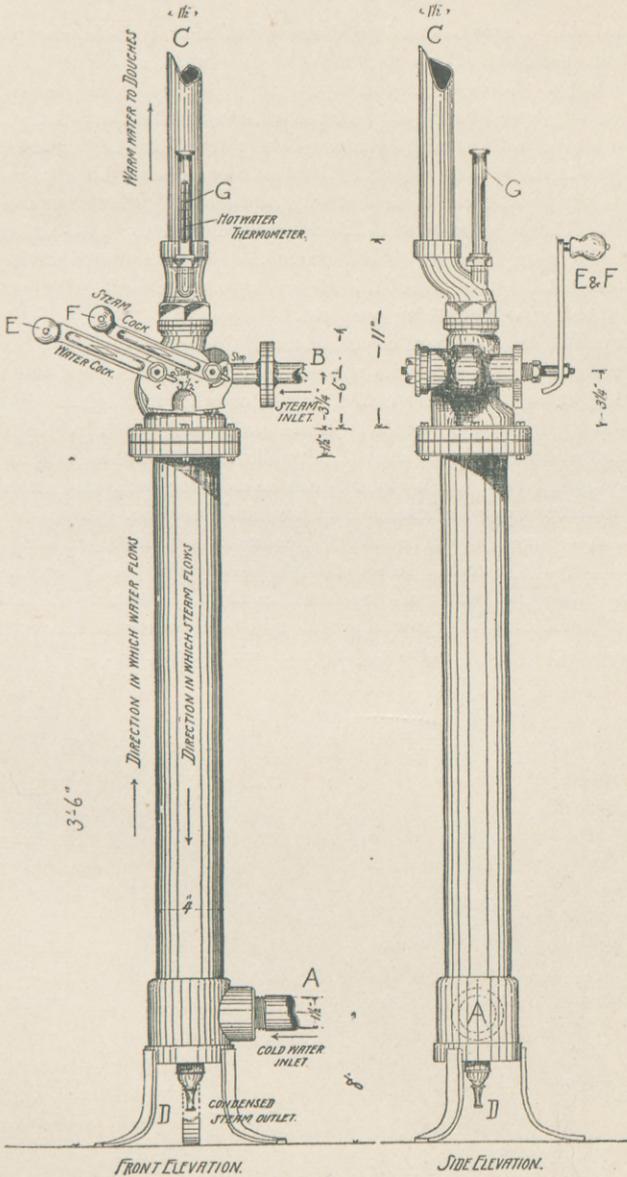


Fig. 3. Fig. 4.
 Counter-stream Apparatus for warming Water by Steam suitable for twelve douches, as used at the State Hospital, Utica, N. Y. (Schaffstaedt Patent.)

is available it may be considered one of the most reliable, cheapest, and most economical apparatus for heating water of which I have knowledge. The Gegenstrom apparatus is, therefore, applicable to public or people's baths, whether the same be fitted up with bath-tubs or with rain-baths or with swimming-baths; it will also be particularly adapted in the case of hot mineral-baths, because with this apparatus the mineral water can be heated without losing any of its component parts. The apparatus will likewise be adapted for rain-baths in factories, manufacturing establishments, schools, hospitals and institutions. A modification of the same is applicable for heating water for washing and scrubbing purposes.

It can be used on board of ocean steamships or vessels of the Navy for rain or tub baths for the passengers, officers and sailors, and for boiling water for making coffee, or tea, or other hot drinks, or for washing purposes, particularly in the emigrants' quarters. In hospitals, prisons, asylums, and other public institutions, as well as in hotels, one form of the apparatus can be used for baths and another for heating water for kitchen and household service. In breweries and malt-houses it will be useful in connection with the cleaning of vats, kegs and barrels. In slaughter-houses or abattoirs, where large quantities of hot water are used for flushing and cleaning the floors of the buildings, in gas-works and numerous other industries the "Gegenstrom" apparatus may be used with advantage.